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EXAMINER	
SHEVIN, MARK L	
ART UNIT	PAPER NUMBER
1793	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,358	MILLER ET AL.	
	Examiner	**Art Unit**	
	Mark L. Shevin	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _31 October 2008 and 23 June 2008_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-17,19 and 20_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-17,19 and 20_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _06/23/2008_.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 1-17 and 19-20, filed October 31st, 2008, are currently under examination. Compared to the claims filed in the preliminary amendment of January 12th, 2006 and examined in the previous Office Action mailed June 6th, 2008: Claim 1 was amended and claim 18 was cancelled.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted June 23rd, 2008 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner. Please refer to applicants' copy of the 1449 form submitted herewith.

Claim Rejections - 35 USC § 103

3. **Claims 1-6, 17, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Agatzini** (GR 1001555) in view of **Queneau** (US 4,044,096), **Patzelt** (US 5,642,863) and **Parker** (US 4,173,519).

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Agatzini:

Agatzini, drawn to a hydrometallurgical method for the extraction of nickel and cobalt from low to very low-grade nickel and cobalt oxide ores (Abstract), teaches that traditional nickel and cobalt extraction methods are not economically feasible for recovering nickel oxide ores with a nickel content of less than 1 wt% (p. 1, lines 25-30)

and thus more prevalent, low-grade ores must be processed in an inexpensive manner instead (p. 2, lines 5-10).

Agatzini teaches that low-grade nickel oxide ores should be subjected to heap leaching using a dilute sulphuric acid as the leaching agent (p. 2, lines 15-20). The problem is that fine materials (clays) impede percolation by swelling, which both absorbs the lixiviant sulphuric acid solution and closes off pores where the solution need trickle (p. 2, lines 22-30).

The other problem identified by Agatzini was the that of the particle size used for heap leaching, which Agatzini taught can be as large as 3 cm while maintaining 'very good' extraction efficiency without incurring costs due to grinding ore prior to leaching (p. 3, lines 1-5).

Agatzini does not specifically teach beneficiating the ore to separate it into an upgraded ore fraction and a coarse, siliceous low-grade rejects fraction which is substantially free from fines and clay materials or separately processing the upgraded ore fraction for the recovery of nickel and cobalt.

Queneau:

Queneau, drawn to increasing the leaching efficiency of nickeliferous lateritic ore (Abstract), teaches that leaching efficiency can be optimized by scalping the ore to remove the coarse, low-nickel fraction of less than about 0.7 wt% Ni (col. 2, line 62) and subjecting the upgraded fines to high pressure acid leaching (HPAL, col. 2, line 40 - col. 3, line 15 and Abstract).

Queneau teaches by example that ore size classification is important in optimizing nickel and cobalt extraction (col. 4, lines 10-23).

Patzelt:

Patzelt, drawn to a method for extracting metals with a higher yield (col. 1, lines 35-40), teaches that heap leaching and tank leaching have their own advantages but are limited to specific grain size distributions (col. 1, lines 48-51). Accordingly, ore is divided into oversize (coarse) and fine material in a classification stage where the oversize material is heap leached and the fine material is tank leached (col. 1, lines 51-58).

The oversize material is left with pore-like interstices that results in extremely uniform permeability to the lixiviant and atmospheric oxygen, which together favor the desired optimal extraction yield of the metals contained in the ore particles al(col. 1, line 62 to col. 2, line 8). The higher permeability of the oversize material results in cheaper heap leaching due to shorter ore transport distances and lower costs for lining the stockpile floor (col. 2, lines 57-66).

Both ore streams may be washed before classification or just the oversize materials may be washed after classification, to wash fine material from the ore (col. 8, lines 28-47).

Parker:

Parker, drawn to a method for facilitating the economical recovery of metal values from low grade ores (col. 1, lines 5-11), teaches, like Agatzini, that slime (aka fines or clays) prevent the advantageous recovery of pregnant solutions due to inhibition

of percolation (col. 1, line 52 - col. 2, line 15). The ore is de-slimed by classification (col. 3, lines 1-5).

Regarding claim 1, it would have been obvious to one of ordinary skill in nickel hydrometallurgy, at the time the invention was made, taking the discloses of Agatzini, Queneau, Patzelt, and Parker as a whole, to modify the low-grade nickel heap leaching process of Agatzini to include separating the ore into a upgraded fraction and low-grade rejects fraction, separating the fines from the coarse low-grade fraction, and processing the upgraded fraction to recovery nickel and cobalt for the following reasons. Queneau taught that leaching efficiency for nickel laterite ore is optimized when the coarse low-grade fraction is separated out and the finer, upgraded section is subjected to a high pressure acid leach (col. 2, line 40 - col. 3, line 15 and Abstract). This is echoed by Patzelt which taught that oversize material is heap leached and finer high metal value fraction tank leached allows greater overall metal recovery.

Motivation to remove the fines from the coarse material comes from Patzelt in teaching the oversize (coarse) material is advantageous heap leached as the interstices and pores are free from finer particles that would obstruct these forms of porosity (col. 1, lines 60-67) and Parker which taught the important of de-sliming by classification (col. 3, lines 1-5).

Regarding claim 2, Patzelt and Parker suggest the removal of fines and clay materials as these hinder leaching by slowing percolation of lixiviant (Patzelt, col. 1, lines 60-67 and Parker (col. 1, line 52 - col. 2, line 15).

Regarding claim 3, Queneau teaches subjecting an upgraded ore fraction to high pressure acid leaching (col. 2, line 40 - col. 3, line 15 and Abstract).

Regarding claims 4 and 6, Parker teaches that the pregnant solutions from the heap leaching and fine soak leaching legs can be combined and sent to the same downstream metal recovery process (col. 1, lines 58-64) which would be expected by one of ordinary skill to recovery nickel and cobalt using ‘known metallurgical processing routes’.

Regarding claims 5 and 19, Agatzini taught the heap leaching of low-grade rejects and as nickel and cobalt recovery is the stated goal of his patent, one would expect the pregnant solution to be passed on for further processing independently from upgraded ore fractions due to the upgraded ore fraction containing being leached in a more aggressive manner such as through HPAL and has a higher nickel to impurity ratio, resulting in a better pregnant solution for further metals recovery as taught by Queneau (col. 3, lines 25-50). Furthermore, one would expect the nickel and cobalt values to be recovered using known, and thus proven, metallurgical processing routes.

Regarding claim 17, Agatzini taught that existing hydrometallurgical techniques cannot treat nickel oxide ores with nickel contents below 1% wt and thus one of ordinary skill would expect such 'low-grade' nickel ores to be used in heap leaching to have nickel contents below 1 wt%. MPEP 2144.05, para I states: “In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists.”

4. **Claims 7-16 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Agatzini** in view of **Queneau**, **Patzelt** and **Parker** as applied to claims 1-6, 17, and 19 above, in further view of **Arroyo** (US 2002/0041840).

The disclosures of Agatzini, Queneau, Patzelt, and Parker were discussed above, however none of these references specifically teach separating laterite ore into limonite and saprolite fractions.

Arroyo

Arroyo, drawn to a hydrometallurgical process for leaching nickel and cobalt from both nickeliferous laterites, namely limonite and saprolite ores, at atmospheric pressure (para 0021).

Limonite and saprolite are separated and leached separately (para 0022-0024). It is suggested that the limonite and saprolite as separated so as to treat the different iron content contained therein (para 0017 and 0024-0025).

Regarding claim 7, it would have been obvious to one of ordinary skill in nickel hydrometallurgy, at the time the invention was made, taking the disclosures of Agatzini, Queneau, Patzelt, Parker, and Arroyo as a whole, to separately leach limonite and saprolite as taught by Arroyo in the heap leaching process as previous established using Agatzini in view of Queneau, Patzelt, and Parker as Arroyo had suggested that separating nickel laterite ore into high iron limonite and low iron saprolite allows for better control of iron precipitation kinetics.

Motivation to remove the fines from the coarse material comes from Patzelt in teaching the oversize (coarse) material is advantageous heap leached as the interstices

and pores are free from finer particles that would obstruct these forms of porosity (col. 1, lines 60-67) and Parker which taught the important of de-sliming by classification (col. 3, lines 1-5).

Regarding claim 8, Queneau teaches subjecting an upgraded ore fraction to high pressure acid leaching (col. 2, line 40 - col. 3, line 15 and Abstract).

Regarding claim 9, Figures 1 and 2 from Arroyo disclose blending the limonite and saprolite leaching solutions together and subjecting them to further processing for metals recovery. Parker teaches that the pregnant solutions from the heap leaching and fine soak leaching legs can be combined and sent to the same downstream metal recovery process (col. 1, lines 58-64) which would be expected by one of ordinary skill to recovery nickel and cobalt using ‘known metallurgical processing routes’.

Regarding claims 10 and 11, Agatzini taught the heap leaching of low-grade rejects and as nickel and cobalt recovery is the stated goal of his patent, one would expect the pregnant solution to be passed on for further processing and independently from upgraded ore fractions due to the upgraded ore fraction being leached in a more aggressive manner such as through HPAL and has a higher nickel to impurity ratio, resulting in a better pregnant solution for further metals recovery as taught by Queneau (col. 3, lines 25-50). . Furthermore, one would expect the nickel and cobalt values to be recovered using known, and thus proven, metallurgical processing routes such as solvent extraction or ion exchange as taught by Arroyo (para 0029).

Regarding claim 12, Arroyo teaches that the acid content pregnant solution from limonite leaching is neutralized and iron precipitated as jarosite by contacting the solution with saprolite ore (paras 0024 and 0025).

Regarding claim 13, Figures 1 and 2 from Arroyo disclose blending the limonite and saprolite leaching solutions together and subjecting them to further processing for metals recovery. Parker teaches that the pregnant solutions from the heap leaching and fine soak leaching legs can be combined and sent to the same downstream metal recovery process (col. 1, lines 58-64).

Regarding claim 14, Agatzini taught the heap leaching of low-grade rejects and as nickel and cobalt recovery is the stated goal of his patent, one would expect the pregnant solution to be passed on for further processing and independently from upgraded ore fractions due to the upgraded ore fraction being leached in a more aggressive manner such as through HPAL and has a higher nickel to impurity ratio, resulting in a better pregnant solution for further metals recovery as taught by Queneau (col. 3, lines 25-50).

Regarding claim 15, Arroyo teaches that the final leachate should be treated for nickel and cobalt recovery by known metallurgical techniques such as solvent extraction or ion exchange (para 0029).

Regarding claims 16 and 20, Arroyo teaches that the sodium content in sea water can be used to assist in precipitating iron (para 0019 and 0024).

Response to Applicant's Arguments:

5. Applicant's arguments filed October 31st, 2008 have been fully considered but they are not persuasive.

Applicants assert (p. 3, para 3) that Agatzini cannot be fairly characterized as rendering obvious the claims of the present application because it treats the entirety of the ore in a single heap.

In response, Agatzini taught that *low-grade* nickel oxide ores should be subjected to heap leaching using a dilute sulphuric acid as the leaching agent (p. 2, lines 15-20). The problem is that fine materials (clays) impede percolation by swelling, which both absorbs the lixiviant sulphuric acid solution and closes off pores where the solution need trickle (p. 2, lines 22-30). The other problem identified by Agatzini was the that of the particle size used for heap leaching, which Agatzini taught can be as large as 3 cm while maintaining 'very good' extraction efficiency without incurring costs due to grinding ore prior to leaching (p. 3, lines 1-5). Well Agatzini did not specifically teach beneficiating the ore to separate it into an upgraded ore fraction and a coarse, siliceous low-grade rejects fraction which is substantially free from fines and clay materials, Queneau, drawn to increasing the leaching efficiency of nickeliferous lateritic ore (Abstract), taught that leaching efficiency can be optimized by scalping the ore to remove the coarse, low-nickel fraction of less than about 0.7 wt% Ni (col. 2, line 62) and subjecting the upgraded fines to high pressure acid leaching (HPAL, col. 2, line 40 - col. 3, line 15 and Abstract). Furthermore, newly cited references Ferguson, Toomver, and Weir teach that it is well-known that proper crushing and screening produces a soft (and thus fine), higher nickel content fraction and a hard (and thus coarse) lower grade

fraction. Burnvill also outlines a beneficiation process that is common in many laterite ores.

Applicants assert (p. 4, para 1) that Queneau provides no teaching or suggestion with regard to heap leaching of a low grade ore fraction nor is there reason to combine the teachings of Agatzini with those of Queneau to produce the claimed invention.

In response, Agatzini taught the heap leaching of low grade ores and thus Queneau need not repeat this same information as precondition for combination or relevancy. One would be motivated to combine Agatzini with Queneau as Queneau taught that leaching efficiency for nickel laterite ore is optimized when the coarse low-grade fraction is separated out and the finer, upgraded section is subjected to a high pressure acid leach (col. 2, line 40 - col. 3, line 15 and Abstract). This is echoed by Patzelt which taught that oversize material is heap leached and finer high metal value fraction tank leached allows greater overall metal recovery. Queneau taught by example that ore size classification is important in optimizing nickel and cobalt extraction (col. 4, lines 10-23).

Lastly, newly cited references “Heap leaching or poor nickel laterites…”, Extraction of nickel and cobalt from Greek low-grade nickel oxide ores...", and GR 1003569 to Agatzini disclose heap leaching a low grade laterite ore.

Applicants assert (p. 4, para 2) that there is no motivation to combine Patzelt because it does not relate to laterite ores and appears to be related to metal extraction from sulfide ores instead.

In response, motivation to remove the fines from the coarse material comes from Patzelt in teaching the oversize (coarse) material is advantageous heap leached as the interstices and pores are free from finer particles that would obstruct these forms of porosity (col. 1, lines 60-67) and Parker which taught the important of de-sliming by classification (col. 3, lines 1-5).

Applicants assert (p. 5, para 2) that one of ordinary skill would not have consulted Parker to create a process that includes recovering nickel from laterite fraction by heap leaching as Parker was directed to the recovery of any gold and silver from slime material.

In response, Patzelt and Parker suggest the removal of fines and clay materials as these hinder leaching by slowing percolation of lixiviant (Patzelt, col. 1, lines 60-67 and Parker col. 1, line 52 - col. 2, line 15), which is a common feature of hydrometallurgical leaching, regardless of the desired metal to be recovered or the ore system.

Applicants asset (p. 6, para 3 – p. 7, para 2) that Arroyo does not teach or cocern heap leaching and is only concern with separating the limonite and saprolite fractions in an atmospheric leach process and does not relate to the separate treatment of upgraded and rejects fractions.

In response, Arroyo had suggested that separating nickel laterite ore into high iron limonite and low iron saprolite allows for better control of iron precipitation kinetics. Heap treatment was taught by Agatzini and the separate treatment of upgraded and rejects fractions is obvious in view of Queneau and Agatzini. Furthermore, newly cited

references Taylor: "Pressure acid leaching" and “Process Selection” as well as Jansen: “The RAMU Nickel Project” disclose separating limonite and saprolite fractions for different processing routes.

Additional Pertinent Prior Art:

6. S. Agatzini-Leonardou et al. **-** Greek patent 1003569/7

S. Agatzini-Leonardou and D. Dimaki. Heap leaching of poor nickel laterites by sulphuric acid at ambient temperature. Paper presented at the *International Symposium “ Hydrometallurgy ‘94”*, Cambridge, England, July 11-15, 1994, and included in the Proceedings, p. 193-208 (IMM and SCI: London).

B. A. Ferguson et al. Falconbridge Dominicana ore handling and preparation - Part Two: Ore preparation. Proceedings of AIME International Laterite Symposium, New Orleans, Louisiana, February 19-21, 1979, p. 169-181, AIME, New York.

T.T. Toomver. Development of Inco’s selective reduction smelting process for nickel laterite ores. Proceedings of AIME International Laterite Symposium, New Orleans, Louisiana, February 19-21, 1979, p. 252-271, AIME, New York.

D.R. Weir and V.B. Sefton. Development of Sherritt’s commercial nickel refining process for low and high iron laterites. Proceedings of AIME International Laterite Symposium, New Orleans, Louisiana, February 19-21, 1979, p. 325-345, AIME, New York.

R.A. Alcock. The character and occurrence of primary resources available to the nickel industry. Proceedings of a Symposium on the Extractive Metallurgy of Nickel and Cobalt. 117th Annual Meeting of AIME, Phoenix, Arizona, January 25-28, 1988, p. 67-89, AIME, New York.

D. Burnvill and D. White. Engineering aspects of the Cawse nickel/cobalt laterite project. Technical Proceedings of ALTA 1999 Nickel/Cobalt Pressure Leaching and Hydrometallurgy Forum, Perth, Australia, May 11-12, 1999. ALTA Metallurgical Services, Melbourne, Australia.

A. Taylor. Pressure Acid Leaching. Technical proceedings of ALTA 1996 Nickel/Cobalt Laterite Project Development Seminal, Perth, Australia, May 15, 1996, ALTA Metallurgical Services, Melbourne, Australia.

N. Jansen. The RAMU nickel project. Technical proceedings of ALTA 1995 Nickel/Cobalt Laterites Seminar, Melbourne, Australia, May 4-5, 1995, ALTA Metallurgical Services, Melbourne, Australia.
A. Taylor. Process Selection. Technical proceedings of ALTA 1996 Nickel/Cobalt Laterite Project Development Seminar, Perth, Australia, May 15, 1996, ALTA Metallurgical Services, Melbourne, Australia.

C. J. Hunter – WO 01/44519 A1

T.W. Lambe and R.V. Whitman. Chapter 129: Soil permeability and filter requirements. In: Soil Mechanics, SI Version. John Wiley & Sons, New York, p. 281-294.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

-- Claims 1-17 and 19-20 are finally rejected
-- No claims are allowed

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588 and fax number is (571) 270-4588. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Mark L. Shevin/
Examiner, Art Unit 1793

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

January 12th, 2009
10-564,358